Remarks

Claims 1 to 14 are currently pending. Independent Claims 1 and 11 are amended to better describe the present invention. Support for this amendment can be found, for example, in FIGS.9-11, and in the Specification at pages 18-21. A Request for Continued Examination is filed concurrently with this Amendment for the Examiner to consider the amendments to the Claims.

In the Office Action, the Examiner maintained and reiterated the rejections of Claims 1-5, 8 and 11-13 under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) in view of Ohashi (U.S. Patent No. 6,059,885). The Examiner indicated that Kawakami teaches nested, axially aligned inner and outer tubes and Ohashi teaches a gas flow divider such that in combination, the two references would have rendered the present invention obvious to one of ordinary skill in the art at the time of the invention. Applicant respectfully traverses the rejections, and submits that the present invention is patentable over the cited references.

Kawakami does not teach or suggest the nested, axially aligned inner and outer tubes as recited in Claims 1 and 11. In particular, Kawakami does not teach an elongated inner tube that extends a distance at least encompassing arrays of orifices in an elongated outer tube. Nor does Kawakami teach or suggest a gas flow divider that divides a gas into a first gas flow into the inner tube and a second gas flow into an annular space defined by the inner and outer tubes, and the first gas flow flows out of the outlet end of the inner tube and into the annular space. Kawakami teaches a cathode based on *successive arrays of short cylindrical volumes* coupled to arrays of passages (holes in the partitions) to further volumes and passages.

In Kawakami, pipe 5 (labeled as an inner tube by the Examiner) extends into partition 3 (labeled as an outer tube by the Examiner). As shown in FIG. 1, pipe 5 extends a short distance encompassing only a portion of openings 15 in partition 3. As indicated by the arrows in FIG.1, gases from pipe 5 immediately change flow directions and exit the space enclosed by partition 3 through openings 15. This is different from the invention of Claims 1 and 11 where elongated the inner tube extends a distance at least encompassing the arrays of orifices in the elongated outer tube so that the first gas flow flows out of the open outlet end of the inner tube and travels back from the close end of the outer tube and flows into the annular space.

In Ohashi as shown in FIG. 4, a straightening vane 17 (labeled as a gas flow divider by the Examiner) is divided by a partition plate 18 into a periphery space area Sx and a center space area Sz. The space area Sx and the space area Sz are *separately* provided with gas supply ports 16 and a gas supply port 19 respectively. The gas supply ports 16 and the gas supply port 19 are *separately* connected to different gas supply systems Gx and Gz respectively. Therefore, the straightening vane 17 is used to introduce gases from different sources at different predetermined flow rates into the center portion Z area and the periphery portion X area in the reactor 41. The straightening vane 17 is different from the gas flow divider recited in Claims 1 and 11, which divides a gas from a single gas supply port into a first gas flow via a first gas flow path and a second gas flow via a second flow path. In Ohashi, the partition 18 completely separates the space area Sx from space area Sz, thus a gas from source Gx or a gas from source Gz flows into a chamber at a predetermined flow rate, respectively. In other words, the straightening vane 17 does not divide a gas into a first gas flow and a second gas flow, as provided by the gas flow divider recited in Claims 1 and 11. Furthermore, the straightening vane 17 is disposed at the upper portion of the reactor 41. In contrast, the gas flow divider of Claim 1 is positioned adjacent the elongated inlet ends of the inner and outer tubes of a gas delivery metering tube, which in turn may be disposed in a linear injector or protective shield.

As the Examiner is aware, before the disclosures of two or more prior art references are properly combined in order to establish a prima facie obviousness under 35 U.S.C. § 103, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. The Examiner did not provide any evidence that shows that there is an explicit or implicit teaching or suggestion in any of the cited references to combine Kawakami with Ohashi to achieve the invention of Claims 1 and 11. However, the Examiner stated in the Office Action that the motivation for combining Kawakami with Ohashi is to distribute the delivered gas to both the inner and outer tubes. Applicant respectfully disagrees. In Kawakami, multiple short cylindrical partitions 2 and 3 are used in an effort to uniformly distribute a reaction gas from pipe 5 into a reaction chamber. There is no evident need to introduce a reaction gas into a buffer 20 formed between the partition 3 and pipe 5. Further, Applicant respectfully submits that Kawakami and Ohashi cannot be successfully combined. Ohashi teaches a straightening vane, or a part of a reaction chamber, disposed at *the upper portion of a reaction chamber* for introducing gases from different sources into a reaction

chamber at different predetermined flow rates. The vane is designed to impart a flow velocity profile of gases, but not to divide a gas into two portions for the purpose of balancing flow in a mixing region. On the other hand, Kawakami teaches a *cathode* disposed within a reaction chamber. The cathode system of Kawakami for improving the overall uniformity of gas flow exiting the cathode is based on *successive arrays of short cylindrical volumes* coupled to arrays of passages (holes in the partitions) to further volumes and passages. The successive arrays of passages are more numerous, smaller, and not aligned between adjacent arrays. A basic problem in fluid flow arises in changing the nature of the flow from a point source type of inlet to a broader area or a line source in the case of a linear injector. This is typically accomplished by implementing a scheme of successive volumes coupled to finer and finer arrays of outlets as described in Kawakami. Modifying this method, as suggested by the Examiner, by incorporating a straightening vane of Ohashi to essentially short circuit some of the gas flow into the cathode assembly, not only does not appear to be an obvious improvement to Kawakami, but would also appear to modify the cathode assembly in a manner that is inconsistent with its intended purpose.

Even a combination of Kawakami with Ohashi would have been attempted by one of ordinary skill, Applicant respectfully submits that such combination cannot arrive at the gas delivery metering tube as recited in Claims 1 and 11. Neither Kawakami nor Ohashi teaches a gas flow divider and an elongated inner and outer tube configuration as recited in Claim 1, as described above. To the contrary, Kawakami teaches uniform distribution of gases exiting a cathode apparatus by use of multiple short cylindrical partitions, and Ohashi teaches control of velocity profile by use of a straightening vane. Any combination of Kawakami with Ohashi cannot arrive at a gas delivery metering tube comprising an elongated outer and inner tube and a gas flow divider, as recited in Claims 1 and 11.

Claims 2-5, 8 and 12-13 recite further limitations to Claims 1 and 11, they are therefore patentable for at least the same reasons as for Claims 1 and 11 as described above. In view of the foregoing, Applicant respectfully requests reconsideration of the rejections under 35 U.S.C. 103(a) over Kawakami and Ohashi.

Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami and Ohashi in view of U.S. Patent No. 5,685,942 (Ishi). Applicant respectfully traverses. Kawakami and Ohashi are discussed above. Ishi does not teach or suggest a gas supply port as recited in Claims 6 and 14. At column 8, lines 16-22 and FIG. 4, Ishi teaches a

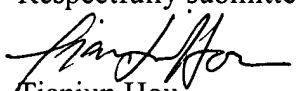
conductive supply pipe connected to a gas inlet and a gas supply source. However, Ishi does not teach or suggest a block having a pocket sealed with a cover to create a confined passage. Any combinations of Kawakami, Ohashi and Ishi, which Applicant believes there is no motivation for one of ordinary skill to do so, will not achieve the invention of Claims 6 and 14.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami and Ohashi in view of U.S. Patent No. 4,836,246 (Lamp). Applicant respectfully traverses. Kawakami and Ohashi are discussed above. Lamp does not teach or suggest the standoff spacer as recited in Claim 7. At column 2, lines 24-40, Lamp teaches a support plug having an aperture to support a first tube in one end. The support plug is different from the standoff spacer of Claim 7 which axially align the inner tube inside the outer tube and provide passage in the annular space formed between the inner and outer tubes. Accordingly, any combination of Kawakami, Ohashi and Ishi cannot achieve the invention of Claim 7.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami and Ohashi in view of U.S. Patent No. 5,849,088 (DeDontney). Applicant respectfully traverses. Kawakami and Ohashi are discussed above. DeDontney teaches a free float shield but does not teach or suggest a gas metering tube as recited in Claim 1. Any combinations of Kawakami, Ohashi and DeDontney, which Applicant believes there is no motivation for one of ordinary skill to do so, will not achieve the invention of Claims 9 and 10.

In view of the foregoing, it is respectfully submitted that this application is now in condition for allowance. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below. The Commissioner is hereby authorized to charge any other fees determined to be due to Deposit Account 50-2319 (Order No. A-67178-1/MSS/TJH).

Respectfully submitted,



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